Six Factors to Consider when Upgrading to an Industrial Grade IP Surveillance System

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What is IP Surveillance?

The "IP" in IP surveillance is an abbreviation for Internet Protocol, which is the most common protocol used for communication over computer networks and the Internet. An IP surveillance application creates digitized video streams that are transmitted through a wired or wireless IP network to enable monitoring and video recording from as far away as the network reaches. In addition, IP surveillance systems can be integrated with other types of systems, such as access control systems.

For most people, the term "video surveillance" brings to mind CCTV (closed circuit TV), which has been used for several decades at banks, office buildings, and other establishments. In comparison, IP surveillance provides attractive benefits such as easy integration, remote accessibility, distributed intelligence, and scalability. In fact, the versatile nature of the Internet is one of the main reasons that analog CCTV systems are rapidly being replaced by network video technology.

Video Encoders reduce upgrade costs

Would you like to make the move from CCTV to IP surveillance but you're worried about what it will cost? The good news is that "video encoders" provide a cost-effective way to get all the benefits of IP surveillance, but without losing the investment in your analog CCTV system.

Video encoders are used to digitize analog video signals, and then send the digital images directly over an IP network. The video encoder turns an analog video system into a network

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video system, and enables users to view live images with a web browser, or with video management software installed on a remote computer. The video encoder also provides "multi-accessibility," which means that authorized viewers at different locations can access images from the same analog camera, at essentially the same time.

Another key product used with IP surveillance applications is the IP camera, which connects directly to the network and gives users the ability to view live video images from a remote location.

However, whether you're using IP cameras connected directly to a network, analog cameras connected to a video server, or even an installation that uses both types of camera, IP surveillance is proving to be attractive in nearly all vertical markets. For a wide range of applications, this revolutionary technology is replacing traditional systems to reduce costs and increase safety. In other applications, IP surveillance is being used for the first time to create and stimulate exciting new markets.

Because of its scalability and other advantages, IP surveillance not only enhances existing surveillance and remote monitoring applications, but also creates a vast number of new applications in general vertical markets such as education, transportation, banking, and retail.

Why use _industrial_ IP surveillance?

Compared to general vertical markets, industrial applications impose several additional requirements on devices, particularly in light of the fact that industrial environments are more hazardous than general or commercial environments. Using general purpose devices in an industrial environment could have a big effect on the safety and stability of the system. In what follows, we six of the most important factors to consider when selecting industrial grade IP surveillance devices for industrial applications.

Factor 1: Power Redundancy

Redundancy is one of the most important factors for many industrial information systems, particularly since more types of industrial equipment now comes with an Ethernet interface.

Unlike the "comfortable" environment of office automation, control systems used for industrial automation must be able to withstand harsh environmental conditions. For this reason, a basic redundancy requirement for control systems is that every part of the communication network should be connected to a backup power supply in case of a power outage. The backup power supply takes over as soon as the electricity fails, minimizing the possibility of damage caused by the system shutting down.

In addition, the system's hardware should at least be compatible with unregulated DC power and have reverse power protection. The two most common ways to send power failure alarms to network administrators is by e-mail or relay output.

1. Alarms by relay output: In this case, when one of the power supplies fails, the relay output will send an alarm to the administrator automatically.
2. Exception reports by e-mail: In this case, an e-mail warning message will be sent to the administrator automatically when a power outage is detected.

Factor 2: Ingress Protection

Unlike in commercial environments, equipment used in industrial environments could incur unexpected damage from external factors. If you use a general purpose device in an industrial environment, you will need to add an extra protection box to prevent the device from being damaged. For this reason, using devices with a rugged design is a key factor for industrial applications.

The Ingress Protection (also abbreviated "IP") rating index (EN60529) is an international classification system that rates the effectiveness of sealings and enclosures for electrical equipment against the intrusion of foreign objects and moisture. The IP rating system gives users a precise description of the effectiveness of an enclosure.

The "IPXX" designation uses two single digit numbers to indicate the degree of protection provided by the product. In general, the first digit involves protection against solid objects, and the second digit involves protection against liquids.

First digit

This number indicates the degree of protection the device provides against contact with external solid bodies. The number can also be used to infer how safe the product is when handled by people.

First Digit	Protection from external bodies	Protection from external contact
0	No protection provided	No protection provided
1	Protected against solid objects with diameter > 50 mm	Protection provided for large-sized external bodies (e.g., a hand)
2	Protected against solid objects with diameter > 12 mm	Protection provided for medium-sized external bodies (e.g., a finger)
3	Protected against solid objects with diameter > 2.5 mm	Protection provided for small-diameter external bodies (e.g., a wire)
4	Protected against solid objects with diameter > 1 mm	Protection provided for essentially all external solid objects
5	Protection against contact with dust; dust accumulations must not hinder the operation of the unit	Protection provided for essentially all external solid objects
6	Protection against contact with dust and against dust accumulations	Protection provided for essentially all external solid objects

Second digit

This number indicates the degree of protection the device provides against different types of contact with liquids.

Second Digit	How the product is protected from contact with liquids
0	No protection provided
1	Protected against water dripping vertically
2	Protected against water dripping at a maximum angle of 15° from the vertical
3	Protected against sprayed water from any direction at a maximum angle of 60° from the vertical
4	Protected against water sprayed from any direction
5	Protected against water jets coming from any direction
6	Protected against flooding (or heavy seas marine applications)
7	Protected against the effects of the immersion
8	Protected against the effects of being immersed indefinitely

Factor 3: Electromagnetic Interference

Compared to commercial environments, industrial environments are more likely to be affected by electrical and magnetic interference. In order to protect electronic devices, higher EMI and surge protection are a must for industrial applications. In addition, some industrial applications require safety approvals and demanding certifications, such as UL508 and ATEX (explosive atmosphere).

Factor 4: Wide Temperature

The operating temperature range of a device is another key issue for industrial products. In fact, some industrial applications require products that are guaranteed to operate in temperatures ranging from -40°C to as high as 75°C. For these types of applications, it is important to look for products that do not use a built-in fan, since products with fans tend to have a lower MTBF.

Factor 5: Industrial Installation

A 35 mm DIN-Rail is used for many industrial applications to provide a convenient means of mounting all of the devices used for the application. For this reason, it is essential that industrial products support both DIN-Rail mounting and panel mounting.

Factor 6: Reliability

People in industry look at either the MTBF (mean time before failure) or warranty period of a product to gauge the product's reliability. However, since the MTBF for many products is not readily available, it is more common to use the warranty period as the determiner.

Whereas general purpose devices tend to be warranted for only 1 or 2 years, the warranty period for products used in industrial applications should be at least 3 to 5 years to ensure the reliability of the system, and reduce the probability that devices will need to be changed frequently.

Summary

In this paper we introduced the concept of "IP surveillance" and pointed out that compared to analog surveillance applications, IP surveillance offers the benefits of easy integration, remote accessibility, distributed intelligence, and scalability. We also noted that "video encoders" can be used to reduce the costs associated with converting from analog surveillance to IP surveillance.

In addition, we highlighted six key factors to consider when selecting products for "industrial grade" IP surveillance applications located in harsh, industrial environments:

1. **Power Redundancy**   *← required*
2. **Ingress Protection**   *← depends on application*
3. **Electromagnetic Interference**   *← EMI and surge protection*
4. **Wide Temperature**   *← -40 to 75°C operating range*
5. **Industrial Installation** *← DIN-rail & panel mounting*
6. **Reliability**   *← Long-term warranty, high MTBF*